

REMARKS

This application has been reviewed in light of the Office Action dated December 6, 2005. Claims 1 – 3, and 6 - 23 are now presented for examination. Claims 4 and 5 have been canceled. Claims 1 – 3, 6 - 19 and 21 - 23 have been amended to more particularly point out and distinctly claim the subject matter regarded as the invention. Support for these amendments is detailed in the remarks that follow. No new matter has been added.

Claims 1 and 18 are independent.

Favorable review is respectfully requested.

The §112 rejection:

Claims 1 – 23 have been rejected by the Examiner under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Examiner has stated it is unclear how the apertures in the first layer and the corresponding layer are connected since the claim does not specify that the apertures pass completely through the layers. The Examiner has

also suggested that the term "vertical passages" is a more accurate description than vertical apertures.

Claim 1 has been amended to replace the term "vertical apertures" with the term "vertical passages" and to more particularly claim that the vertical passages pass completely through the layer. Support for this amendment is found at least in paragraph 0072 and in Figure 4B and 5F.

Further, the Examiner has stated it is unclear how many elements make up a "set" of vertical apertures. Claim 1 has been further amended to delete the term "set" and to more particularly claim that there are at least two vertical passages. Support for this amendment is found at least in Figure 3 and 4B.

Further, the Examiner has stated it is unclear what a "horizontal aperture" means. The Examiner has suggested the term "horizontal channel extending in a horizontal direction" is a more accurate description. Claim 1 has been further amended to more particularly claim a plurality of horizontal channels extending in a horizontal direction. Support for this amendment is found at least in paragraph 0045.

Further, the Examiner has stated it is unclear which two sets of vertical apertures are connected by the horizontal apertures. Claim 1 has been further amended to more particularly claim that at least some of the plurality of horizontal

channels connect at least two vertical passages. Support for this amendment is found at least in paragraph 0045 and Figure 4B.

Further, the Examiner has stated that claim 11 recites the element is adapted for a particular use and that this is not a further limiting step of the claimed method. Claim 11 has been amended to more particularly claim that the removable layer has a thickness less than 1.0mm. Support for this amendment is found at least in paragraph 0045.

Further, the Examiner has stated the "whereby" clause in claim 12 does not add any further weight for it is directed to what may occur away from the device. Claim 12 has been amended to delete this "whereby" language.

Further, the Examiner has stated claim 13 seems directed to an intended use rather than further limiting the method. Claim 13 has been amended to more particularly claim that the removable liner is selected from a group of materials which is a carrier for a reagent. Support for this amendment is found at least in paragraph 0076.

Further, the Examiner has stated it is unclear in claims 14 – 17 which said sets of vertical apertures are being referenced. Applicants believe this issue has been addressed in the previously discussed amendment to claim 1, and claims 14 – 17 have been amended to be consistent with the amendment to claim 1.

Further, the Examiner has stated a number of claims contain "whereby" clauses and state the intended use, but no clear steps of operation. Claims 12, 13 and 17 have been amended to delete the "whereby" clause language.

Further, the Examiner has stated the "adapted to" phrase in claim 19 does not add any further structure but rather intended use or function. Claim 19 has been amended to more particularly claim that one of the vertical passages has a restricted portion. Support for this amendment is found at least in paragraph 0056 and Figure 8A.

Further, the Examiner has stated the reagents in claim 20 are not positively claimed as elements of the device. Claim 19 has been further amended to more particularly claim first and second reagents as elements of the device.

Further, the Examiner has stated claims 21 – 23 are method claims dependent upon apparatus claims and therefore have improper dependency, are not further limiting and are too unclear for examination. Claims 21 – 23 have been amended to depend, directly or indirectly, from independent apparatus claim 18.

Further, the Examiner has stated it is unclear in claim 19 what the structure of a capillary retention valve is. Applicants believe this has been clarified in the previously discussed amendment to claim 19 to more particularly claim that one of the vertical passages has a restricted portion.

Further, the Examiner has stated it is unclear how the applicant can specify the device as containing "U-shaped structures". Claims 1, 2, 3, 8, 9, 10, 18, 21 and 22 have been amended to more particularly claim that the invention provides horizontal and vertical interconnect structures. Support for this amendment is found at least in paragraph 0045 and Figure 4B.

The §102 rejection:

Claims 18 – 23 have been rejected by the Examiner under U.S.C. §102(b) as being anticipated by Dugan U.S. Pat. No. 5,843,385.

Claim 18 has been amended to more particularly claim a plurality of ceramic layers sintered together, the ceramic layers comprised of a material selected from the group consisting of alumina, glass ceramic, aluminum nitride, borosilicate glass and glass. Support for this amendment is found at least in paragraphs 0045 – 0047.

Dugan teaches a plate-type reactor of conventional size and material with novel means for controlling the temperature and the residence time of the reagents. The reference does not teach the use of ceramic materials, but rather teaches away from the use of ceramic materials by teaching the use of thermally conductive materials, preferably metals. (Col. 9, lines 28 – 33)

Applicants respectfully submit that claim 18, as amended, is not anticipated by the reference. Since claims 19 – 23 depend, directly or indirectly, from claim 18, and since claim 18, as amended, is believed to be allowable, then claims 19 – 23 are believed to be allowable as well.

Claims 1 – 11 and 16 – 23 have been rejected under 35 U.S.C. §102(e) as being anticipated by Anazawa et al. US 2003/0175162 A1.

Claim 1 has been amended to more particularly claim a plurality of ceramic layers sintered together, the ceramic layers comprised of a material selected from the group consisting of alumina, glass ceramic, aluminum nitride, borosilicate glass and glass. Support for this amendment is found at least in paragraphs 0045 – 0047.

As discussed above, Dugan teaches a plate-type reactor of conventional size and material with novel means for controlling the temperature and the residence time of the reagents. The reference does not teach the use of ceramic materials, but rather teaches away from the use of ceramic materials by teaching the use of thermally conductive materials, preferably metals. (Col. 9, lines 28 – 33)

Anazawa teaches the lamination of resin layers to form microfluidic devices. (Col 1, paragraph 0002) Accordingly, neither Dugan, nor Anazawa, nor a combination thereof renders obvious claims 1 and 18, as amended. Since claims 2 – 11, and 16 – 23 depend, directly or indirectly, from claims 1 and 18 respectfully, and since claims 1 and 18, as amended, are believed to be allowable, then claims 2 – 11 and 16 – 23 are believed to be allowable as well.

Drawings:

The Examiner has objected to the drawings under 37 CFR 1.83(a) for failing to show every feature of the invention specified in the claims. Specifically, the “removable liners” must be shown or the features canceled from the claims.

Figure 4B has been amended to illustrate the removable liner element.

Allowable Subject Matter:

The Examiner has indicated that claims 12 – 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and to overcome the §112 second paragraph rejections.

Applicants appreciatively acknowledge the Examiner's indication of allowable subject matter. Based on the amendments to independent claim 1 the applicants believe claims 12 – 15 should now also be allowable as depending from an allowable base claim.

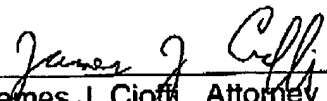
Summary:

In view of all the preceding amendmnets and remarks, it is respectfully requested that any objections or rejections to this application be reconsidered and withdrawn. Further action with respect to the present application is earnestly solicited. If the Examiner finds this application is deficient in any respect, the Examiner is invited to contact the undersigned at the Examiner's earliest possible convenience.

For the foregoing reasons, allowance of the claims is respectfully solicited.

Respectfully submitted,
James N. Humenik, et al.

By:


James J. Cioffi, Attorney
Registration No. 51,564
Telephone: (845) 894-3363

JJC/hh